Creating and Implementing a Rapid Damage Assessment Program for Boca Raton Fire Rescue Services

Executive Analysis of Fire Service Operations in Emergency Management

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CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed: _____

Abstract

The problem was that the BRFRS doesn't use a rapid damage assessment (RDA) program. The purpose of this project was to offer recommendations on a RDA program and suggest steps to create change for BRFRS. This paper used action research methodology; 5 research questions were developed to answer questions:

1) What is RDA, why is it important?
2) Who should conduct RDA?
3) How are other departments successfully performing RDA?
4) What elements should the RDA contain?
5) What forms should BRFRS use?

The procedures utilized for this ARP consisted of a literature review and survey. Results indicated the need for a program.

Recommendations included evaluation, implementation of a SOP and RDA program, provide training, reevaluate and update.

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Introduction

The fire service today has progressed into a more proactive, rather than a reactive organization in many facets. One of these facets is that of responding to disasters, either manmade or natural disasters. In the past several years, there have been numerous disasters that have impacted the United States significantly, for instance the September 11, 2001 attacks on the World Trade Center, train wreck in South Carolina, explosion in Texas, mudslides in California and hurricanes Dennis, Katrina and Wilma to name a few. Damage assessment of needs and resources is required in all types of disasters; whether it's manmade or natural, and no matter how fast the disaster happens.

Like many fire departments throughout the country, Boca Raton's damage assessment has not evolved as an effective, up to date tool that meets the needs of the department and community. The problem is that the Boca Raton Fire Rescue Services Department (BRFRS) does not make use of an official rapid damage assessment program (RDA).

"The better our planning is prior to an emergency response, the better we will be able to direct our resources toward ensuring an efficient operation" (Cotreau, 1994, p. 49). BRFRS relies on an antiquated process for completing rapid damage assessment. According to McEntire (2002) "of all the functions performed after a disaster, there are perhaps none more important than damage assessment" (p. 9).

The purpose of this research project is to offer recommendations on a RDA program and to suggest the steps necessary to create the needed change for BRFRS. In conducting this research, five research questions were developed to help lead the author in discovering these ways. This paper will use action research methodology in an attempt to answer the following research questions:

1. What is RDA, and why is it important?
2. Who should conduct RDA?
3. How are other departments successfully performing RDA?
4. What elements should the RDA contain?
5. What forms should BRFRS use?

Background and Significance

The City of Boca Raton is located on the southeast coast of Florida, in Palm Beach County. In May of 1925, the Town of Boca Raton was incorporated at the height of the Florida land boom. Since the land boom of the 1920's Boca Raton has grown to be the second largest municipality in Palm Beach County. Boca Raton has a year round population of 85,377 that inflates to approximately 125,000 during the winter months. BRFRS provides this ocean side community with a full array of emergency and non-emergency functions. The city of Boca Raton has eight fire stations that provide emergency services within the city's 27 square miles. These services include, but are not limited to: fire suppression, paramedic level emergency medical services, tactical rescue, hazardous materials incident mitigation, pre-construction fire safety plans review, fire safety inspections, fire investigations, and community health and public fire safety education, along with Community Emergency Response Training (CERT). A staff of 219 employees provides emergency operations and staff support functions. Approximately 180 personnel are certified paramedics, and 15 are certified emergency medical technicians (EMT). BRFRS operates 6 Advanced Life Support (ALS) Engine companies, 1 ALS Ladder Companies, 8 ALS Rescue Units, 2 Brush Trucks and 1 Special Operations Vehicle.

Boca Raton has experienced varying levels of disaster in the past, both manmade and natural. With Boca Raton's geographic location, the need is present for a more proactive approach

with damage assessment due to natural disasters. In the past two years, there have been eight hurricanes that have struck the State of Florida, with four of those affecting the City of Boca Raton. The possibility of manmade disasters also exists. Whether it may be a civil disturbance, explosion, fire, hazardous materials incident or a terrorist attack, any one may cause a major disaster and require the mobilization of many City Department resources. In October of 2001, the offices of American Media Incorporated located within the City, was the site of the first anthrax attack in the United States.

At the present time, BRFRS has not implemented a RDA program. In the *City of Boca Raton Emergency Preparedness Plan,* (2005) it has several references to damage assessment and BRFRS responsibility. One reference in the plan has BRFRS conducting damage assessment to BRFRS property and equipment only, and another has BRFRS keeping a tally of the extent of damage to utilities and flooding, but no reference to who is conducting the assessment. The Development Services Department's section of the plan makes reference that the Code Enforcement Staff will conduct comprehensive damage assessment activities coordinated by the Chief of Civil Defense, again with no reference to BRFRS assisting or conducting any damage assessment.

With the City being located in a geographic location that is susceptible for a possible impact of a hurricane or tropical storm, the potential for a natural disaster is likely. According to *Hurricane City* (2005) an Internet site that keeps hurricane statistics, the City of Boca Raton is ranked 14th out of the top 50 for getting brushed by (within 60 miles) or hit by either a hurricane or tropical storm. They also estimate that this would happen every 2.60 years. Since 1871, Boca Raton has been affected 52 times from different storms, with five storms being major storms with winds in excess of 100 mph. While Boca Raton has been fortunate enough to not experience a category four or five hurricane in the past fifty years, other parts of South Florida are not so lucky. In August 1992

hurricane Andrew passed well South of Boca Raton, approximately 70 miles in Dade County where it caused extensive damage. The final total in property damage was near 30-billion dollars, making it the costliest natural disaster ever, until August 2005 when Hurricane Katrina struck the Southeastern United States. The 2005 hurricane season has been the busiest ever, with 26 named storms. A number of scientists link the increase and intensity of the hurricanes to global warming. In his article Trenberth (2005) explains that some environmental changes will affect hurricane intensity and rainfall, but the amount of hurricanes remain uncertain. The future also remains uncertain to the amount and intensity of hurricanes, but the potential for a possible hurricane is more probable than not.

This paper will seek to offer recommendations on a RDA program and to suggest the steps necessary to create the needed change for BRFRS in reducing the risk of life and property loss to the citizens and firefighters of Boca Raton through RDA. In the past, present and near future BRFRS has relied on an antiquated process for damage assessment. With support of funding and resources from Federal and State agencies needed following any significant disaster, BRFRS needs to be prepared with a RDA program in order to request the required assistance from the appropriate agencies.

This applied research project (ARP) is relevant to the National Fire Academy's (NFA) Executive Fire Officer Program (EFOP) *Executive Analysis of Fire Service Operations in Emergency Management* (EAFSOEM) course in the area of Unit 6, "Damage Assessment". The student manual refers to the enabling objectives:

1. Develop a process for obtaining and using damage assess information.
2. Identify damage assessment procedures and how to train teams.

3. Discuss the purpose of data collection related to damage assessment. (NFA, 2004, p. SM 6-1)

Finally, this research project supports the efforts of the United States Fire Administration (USFA) operational objective that says "to respond appropriately in a timely manner to emerging issues" (NFA, 2003, p. II-2). As the city has grown, so have the services provided and the amount of emergency calls handled. Brunacini (1999) talks about the crucial mission of delivering the best possible service to the customer as the main priority of the fire service (p. iii). To deliver the best possible service especially after a disaster would include a rapid damage assessment program to prioritize the resources and responses for the disaster and any resulting incidents.

Literature Review

The purpose of this research project is to offer recommendations on a RFA program and to suggest the steps necessary to create the needed change for BRFRS. This program will assist BRFRS in prioritizing and responding to disasters within its jurisdiction. Five basic questions need to be addressed.

The first question, what is RDA, and why is it important? There are several different types and ways of performing damage assessment. The first being the initial, rapid or immediate damage assessment, the next is a detailed, preliminary or post incident damage assessment and the last is called an engineered or technical damage assessment. In his article David McEntire (2002) describes the three types of damage assessment as rapid, which is completed quickly to grasp the damage from the disaster, preliminary as the one conducted from state and federal officials to obtain presidential disaster declaration, and technical as the most in-depth assessment (p. 9). According to Sarausad (1995) "Emergency assessment as the word connotes is a rapid evaluation, at the soonest possible time" (p. 35).

The EAFSOEM Student Manual (2004) defines damage assessment as "gathering of information related to the impact of an event, or series of events, on life and property within a defined area" (p. 6-2). The manual also defines immediate damage assessment, as a rapid estimate of damage inside the incident area. RDA is compared to a scene size-up that a company officer would conduct on a fire call, but in a larger scale. More emphasis is placed on the immediate assessment so the right amount and type of resources can be deployed for assistance. A post incident damage assessment is conducted after the incident is over, it is more thorough and precise than the immediate damage assessment, and time is not a factor when performing the assessment (EAFSOEM Student Manual, 2004).

The National Fire Protection Association (NFPA) developed a document NFPA 1600 *Standard on Disaster / Emergency Management and Business Continuity Programs* (2004 edition) which defined damage assessment as "an appraisal or determination of the effects of the disaster on human, physical, economic, and natural resources" (p. 1600-4). The National Commission on Terrorist Attacks Upon the United States, or the 9/11 Commission along with the Secretary of the Department of Homeland Security endorsement, had recommended NFPA 1600 to be the National Preparedness Standard. In his article, Schmidt (2005) expressed that NFPA 1600 establishes a common collection of criteria and terminology that the private sector can prepare for disasters. He also pointed out that the need for the private sector to be prepared was two fold, they controlled 85% of the critical infrastructures in the country, and they would actually be the first people on any scene.

The definition of damage assessment retrieved from the United States Environmental Protection Agency (2004) website states "The evaluation or determination of losses, harm and injuries to persons, property or the environment" (damage assessment section, ¶ 1). Horie, et al.

(2003) found that "initial damage estimation was conducted to consolidate information on the disaster at an early stage, which provided disaster responders with a basis for decision-making …" (p. 342). Pat Moore (1996) expressed that property damage could look a lot worse than it is, or not as bad as it looks, immediately following the incident the outcome centers concentrates on proper assessment (p. 17). According to the Asian Disaster Preparedness Center (2000):

> If officials responsible for organizing post-disaster relief operations are to make effective decisions about the deployment of resources, it is essential that they be properly informed. They must have appropriate and timely information about what has happened, what needs to be done, and what resources are available. Their decisions can save lives, minimize injury, damage and loss prevent escalation, prevent secondary hazards and inform people who need to know. (p. 2)

Damage assessment is critical in determining the damage suffered, its results, and identifying the areas that suffered the greatest amount of damage. The damage assessment process will help prioritize emergency responses, determine the resources needed, and assistance required from local, state, or federal entities. If damage assessment is performed thoroughly, emergency response could be more effective, faster, and equipment and personnel used better (Florida Disaster Organization, n.d.).

The second research question asks who should conduct RDA? According to Cope and McEntire (2004) an immediate or initial damage assessment is generally completed by a first response agency such as the fire department (p. 7). Fire units can complete immediate damage assessments in their first due or primary areas or districts. The emergency responding agencies can share the responsibility for conducting RDA (EAFSOEM Student Manual, 2004). In his article, he stated, "Fire department officials are the most logical and best qualified personnel to perform an

accurate damage assessment" (Strickland, 1998, The Windshield Survey section, ¶ 4). Schmidt (2005) wrote "Response to, and recovery from, any disaster, large or small, requires the coordination of all resources both public and private" (Direction, Control, and Coordination section, ¶ 1).

In their article *Process of Housing Damage Assessment,* it was mentioned that local government was responsible for conducting rapid damage assessment immediately after the disaster. In addition, the local government in Japan must notify the national government with its damage assessment following a disaster (Horie, et al., 2003, p. 345). Local governments should perform a rapid damage assessment by surveying the disaster area. Typically, people used for this effort have included individuals with familiarity in assessment of homes and businesses, i.e. human services officers, building inspectors and tax assessors. According to Kornfield (1995) "Building assessments were typically done in the field by a team of two inspectors using guideline provided in the *ATC – 20 – 1 Field Manual*" (p. 4). In an article from the *Building Safety Journal* (2003) three-person damage assessment teams are consist of a administrative professional, an architect, and a building inspector (p. 19). Local governments damage assessment must be correct and immediate. The proper local and county officials should be properly trained in damage assessment, which is a worthy emergency management function. In certain jurisdictions teams of employees are designated areas to assess after the disaster (Kemp, 2003, Preparedness section, ¶ 5).

The Statewide Emergency Response Plan (SERP) has four levels of response: local, county, state and federal. Initially the local government will have responsibility of the emergency response and assistance, along with mitigation of the incident with resources on hand at the local level. The local Fire-Rescue agency is the primary level of protection when responding to disasters. To determine whether local resources can meet the needs imposed by a disaster, local officials must

conduct a damage assessment when an incident occurs. Once the disaster overwhelms the local resources, the county would then be requested for assistance, followed by the state then federal resources (2005).

According to the National Response Plan (NRP), "immediately after an incident, local jurisdictions respond using available resources and notify State response elements. As information emerges, they also assess the situation and the need for State assistance" (2004, p. 91).

The Damage Management Center at the University of Wisconsin-Madison (1987) indicates there may be some confusion as to which government department is responsible for conducting damage assessment. In addition, other groups such as the military, or volunteer organizations conduct their own damage assessments (p. 53).

The third question addresses how are other departments successfully performing RDA? Pembroke Pines Fire Rescue has a standard operating procedure (SOP) 2.1.08 in place for peacetime emergency plan for hurricanes. In this SOP in the procedures section, it provides guidelines to follow during a hurricane watch and warning stages of the storm. The SOP (2005) continues with the all-clear section and references damage assessment:

a. Rapid Impact Assessment to determine the amount of wind damage and standing water will be completed upon all clear and e-mailed or faxed to the Broward County EOC.
b. Rapid Impact Assessment to be completed 1 to 4 hours after all clear.
c. Fire Stations; Assess all stations for damage and document when the manpower is available after emergency search and rescue operations are under way. (p. 5)

In the City of Coral Gables, Emergency Operations Plan, Rescue Assessment Procedure (2002) section states:

> The ability for the City of Coral Gables to perform an accurate situation assessment. Within the first few hours after an incident it is critical to provide adequate response for life threatening situation and imminent hazards that may impact Coral Gables. A rapid assessment will provide the City officials the ability to prioritize response activities, allocate resources, request appropriate mutual aid and State and Federal assistance. (p. 19)

Coral Gables Fire Rescue (CGFR) procedure addresses rescue/recon teams that are suppose to rapidly assess the City's damage. This is to be completed in 6 hours or less. These teams will consist of personnel from the following City departments: 2 from Public Service, 2 from the Police Department, 2 from the Fire Department – which one of is the team leader, 1 heavy equipment operator from the Public Works Department, 1 person from the Building Department for damage assessment, and 1 more person from the Public Works Department also for damage assessment. There are nine teams assigned to different sections of the city. The primary function of the teams is initial damage assessment of their sector. A secondary function is a small amount of debris removal to allow rescue units into areas the rescue/recon team designated for a response. The department's training division is to provide training annually on the rescue/recon team, and this should be completed in May prior to the hurricane season (CGFR, 2003, p. 19-20).

With the Fort Lauderdale Fire Rescue Department (FLFRD), the procedure of rapid damage assessment is referred to as Rapid Impact Assessment or RIA. It is the intention of the Broward County Emergency Operations Center (EOC) officials to obtain RIA data from fire rescue operations personnel quickly following a major disaster. The county is broken down into ¼ mile grids, and each jurisdiction is responsible for managing and reporting the RIA information within their jurisdiction. The RIA is designed to assess the extent of damage, assess

the need to request for further assistance, and to assist in effective management of all county resources. Each fire station should conduct an RIA in the area around the station immediately following the incident and report the information to the EOC. The report should contain the name of the jurisdiction, grid number, and category of damage for flooding and wind. The categories range from 0, which is no damage to 4 that is catastrophic. The RIA should not take priority over emergency responses (FLFRD, 2003).

Winter Park Fire & Rescue (WPF&R) conducts two different damage assessments. The first is a Snapshot Assessment. This is where the officer or other assigned personnel complete a quick assessment of the personnel at the station, equipment at the station, the station itself and access to and from the station. Also, a rapid assessment of damage in the neighborhood, based upon a percentage of destruction of the immediate vicinity. The second type of damage assessment is an Intermediate Assessment, which is an assessment of a unit's primary response area. This assessment includes the needs and situations for critical infrastructures and takes priority over routine work (WPF&R, 2005).

At the Pensacola Fire Department (PFD) the Fire Chief or his designee, coordinate the damage assessments with the Escambia County officials. The department's training division makes certain that disaster training is conducted, including damage assessment utilizing the snapshot form. PFD also conducts two types of damage assessment, the first called Disaster Assessment Snapshot and the second Intermediate Assessment. Disaster Assessment Snapshot is a preliminary assessment that includes reports of personnel, equipment, facilities and access to and from the facilities where the snapshot is conducted, along with a survey of conditions in the immediate area. The Intermediate Assessment is an assessment of the primary response area and its target hazards, and takes priority over routine incidents (PFD, n.d.).

The City of Miami Fire Rescue Department (MFRD) performs damage assessment following a storm or hurricane by having the company officer go outside following the storm and do a visual inspection of the surrounding area near the fire station. The officer would compare damage in the area to that of pictures on the Emergency Damage Assessment Card. This card (Appendix A) has four pictures with a numerical value for each picture. The officer then has to decide what picture the area is similar to then call in and report the location and number value. The Miami Fire Prevention Bureau also conducts damage assessment utilizing the card, but they use cars normally and prior to the storm pick-up trucks or SUVs are obtained for their use (MFRD, n.d.).

The Broward Sheriffs Office (BSO) and Miami-Dade County Department of Emergency Management ask residents to assist in damage assessment, in addition the municipal fire departments also conduct a rapid assessment. BSO asks residents to print their Snapshot Damage Assessment Form (Appendix B) and call in after the storm and report the damage in their neighborhood (BSO, n.d.). Miami-Dade has an online form (Appendix C), the Neighborhood Damage Assessment Entry Form that is to be completed by residents and submitted online to the Emergency Management Department (Miami-Dade, n.d.).

The Palm Beach County Department of Emergency Management (PBCDEM) has created the Initial Damage Impact Survey (IDIS) which is a quick windshield survey assessing the damage to the community. County Fire-Rescue, municipal fire departments and the County's Planning, Zoning & Building Department will all conduct the IDIS. The personnel completing the IDIS compare damage to photographs (Appendix D) and definitions (Appendix E) for building, flooding and infrastructure damage (Palm Beach County, n.d.).

The fourth question asks what elements should the RDA contain? The EAFSOEM Student

Manual (2004) states:

The immediate damage assessment must address specific needs or concerns:

- existing or potential need for emergency action;
- life safety threat to the general public;
- possible hazards to emergency response personnel;
- existing or potential property damage;
- damage to roadways;
- damage to municipal services; and
- other unsafe conditions.

An immediate damage assessment should answer the following questions:

- Have deaths or injuries occurred?
- Does the potential for loss of life or injury exist?
- Have unsafe conditions been created?
- Is there a need for emergency services?
    - What type?
    - What amount? (p. SM 6-3)

The City of San Francisco utilizes a program called the *ATC-20 Procedures for Post-earthquake Safety Evaluation of Buildings,* which establishes a set standard for damage assessment and information collection. The ATC-20 classifies buildings into three categories Unsafe, Restricted Use and Inspected. Unsafe classification indicates a building with extensive damage or hazards, Restricted Use designates a building where part of the building is inaccessible due to damage, and Inspected meant no significant hazards were found. San Francisco added a fourth category called Secured which meant the buildings didn't pose a threat

but were in need of repair before occupancy could happen (Kornfield, 1995, p. 3-4).

The Asian Disaster Preparedness Center (2000) acknowledged that "some of the data required is already available in the form of baseline data (maps, population statistic etc.), which must however be accessible, but this baseline data must be supplemented by real-time information" (p. 2). Damage assessment is a recurring procedure, not a one-time event (Cope and McEntire, 2004, p. 7). According to Kemp (2003) as the local government response develops, the damage assessment information must be updated and confirmed frequently to ensure its accuracy (Preparedness section, ¶ 5).

In her, A Guide to Successful Damage and Needs Assessment, Planitz (1999) wrote:

Every assessment process comprises of five elements or activities:

- Planning and preparation: assessments need thorough planning, design and preparation well in advance.
- Survey and data collection: the collection of data about the extent of damage caused by the disaster is the basis upon which decisions on relief and recovery are taken. Information gathering must proceed rapidly and thoroughly.
- Interpretation and forecasting: incoming assessment data has to be thoroughly analyzed and interpreted in order to become meaningful and useful for decision-makers.
- Reporting: information and results of the analysis process need to be disseminated in a format that enables disaster managers and decision-makers to formulate action programs.
- Monitoring: assessments must be seen as a continuous process of re-evaluating the needs and the appropriateness of response and recovery interventions. (p. 5-6)

The City of Coral Gables Fire Department rescue/recon teams have maps developed with predetermined routes that are routinely inspected following a storm. The teams also operate with SOP's in place, due to the possibility of no communications available between command and the teams. The priorities and missions that are set up with the maps and SOP's may be altered or updated during briefings when the teams are activated following the storm (CGFR, 2002).

In Fort Lauderdale, their RIA looks at the elements of wind and flood damage in four different categories. The categories start at 0 for no damage, 1 for minor damage, 2 for moderate damage, 3 for severe damage, and 4 for catastrophic damage. Each damage category has a brief description of the potential damage or destruction that the assessment team is looking for that was inflicted by the disaster. The categories and the assessor's judgment should be used when conducting the RIA, but not all elements within a category description need to be observed (FLFRD, 2003).

WPF&R and PFD perform fundamentally the same snapshot survey. The first element is that of personnel, which has three ratings: 1 – no injuries, 2 – minor injuries, and 3 – serious injuries. The second element is for equipment, again with three ratings: 1 – all in service, 2 – in service and needs repairs, 3 – out of service. The third element is facilities: 1 – minimum or no damage, 2 – serious damage, 3 - uninhabitable. The fourth element is for the neighborhood and has scores that are 0 to 16 with 0 equivalent to no damage and 16 equal to complete destruction. WPF&R has an added category of access which also has a rating of: 1 – clear, 2 – minimal blockage, and 3 – major blockage (WPF&R, 2005; PFD, n.d.).

The fifth and final question asked what forms should BRFRS use? The forms that are used should be user-friendly (Sarausad, 1995, p. 35). Damage assessment forms should be produced and trained on prior to actually needing them. The forms should also be easy to use and provide

accurate information. Utilizing the forms will help make the process of damage assessment easier and more precise (EAFSOEM Student Manual, 2004, p. SM 6-9). Asian Disaster Preparedness Center (2000) explained, that reports should be of a standard format with common terminology since they are obtained from many sources and this will assist in the procedure of examination and collation of damage assessment information. In addition, the forms would be more useful if designed by the people receiving the information, and should be designed to easily guide the person conducting the assessment (p. 4).

The City of Edgewater Fire Rescue (EFR) makes use of three different forms for damage assessment. The first is a tally sheet (Appendix F) with damage totals broken down into three categories: 1- destroyed, 2- major damage, 3- minor damage, and these categories have sub-categories of: single family dwellings, mobile homes, manufactured homes, apartments, businesses, and public buildings. The specific area is described at the top of the form. The second form (Appendix G) is a summary sheet used to total all tally sheets for the different zones established for the City. The third form (Appendix H) is a detailed damage assessment worksheet that has more of a description of the damage to the building (EFR, n.d.).

Indian River County Fire Rescue (IRCFR) uses a form (Appendix I) for residential losses. This form details the type of home, if it is the primary or secondary residence of the occupant, amount of damage, water in the structure, replacement cost, estimated dollar loss, whether the occupant is insured and estimated income of the family residing at the damage structure (IRCFR, 1996).

PFD utilizes a form (Appendix J) for their Snapshot survey, and it indicates the percentage of damage in the immediate area, and the scores for the elements of personnel, units, facilities, and access (PFD, n.d.).

PBCDEM utilizes three forms; the first (Appendix K) is the IDIS Directions, which briefly state what information is needed. The second form (Appendix L) is an Overall Damage Assessment Jurisdictional Survey that indicates the status of target hazards, major roadways and developments. The third form (Appendix M) is the Primary Survey of the personnel, equipment and apparatus and facilities (Palm Beach County, n.d.).

In summary, the reviewed literature has influenced this applied research project by establishing a need and importance for a RDA program. RDA will assist BRFRS in determining the initial response needs of the community, and if further assistance is needed from the county, state or federal levels. The reviewed literature emphasized the importance of damage assessment as a significant fraction of the recovery process. Of the many jurisdictions, performing RDA each has similar elements that provide a comprehensive view of the damage sustained to the community from the disaster. "The role of the fire service as America's first responder demands a level of equipment, training and related support to effectively meet these responsibilities, to serve communities and the country during times of significant events" (International Association of Fire Chiefs, n.d., p. 4).

Procedures

The purpose of this research project is to offer recommendations on a RDA program and to suggest the steps necessary to create the needed change for BRFRS. This paper will use action research methodology to help direct this research project towards the answers of the research questions. When researching the questions four primary resources were utilized.

First, the process began at the National Fire Academy's Learning Resource Center (LRC) in Emmitsburg, Maryland in August 2005 while attending the EAFSOEM course. The LRC was chosen due to its extensive collection of resources pertinent to the fire service. Research and

data collection began with a search of the online card catalog at the LRC, by entering damage assessment, damage survey, RDA, assessment of damage, rapid assessment of damage and quick assessment. The results of this research and data collection included Applied Research Papers, fire service books, fire service trade journals and magazines, national standards, brochures and various training publications. To further review the research and data that was collected, photocopies were made.

Next, BRFRS's training library was also utilized for the literature review. Sources that were used included fire service textbooks; fire service trade magazines, fire service handbooks, and fire service codebooks, and Boca Raton's emergency preparedness plan.

Third, an extensive search was conducted online by using several different search engines by entering damage assessment, damage survey, RDA, assessment of damage, rapid assessment of damage and quick assessment. Information was then reviewed for any pertinent material; if applicable, it was downloaded and printed. In addition, some of the author's personal collection of books and trade magazines were utilized for the review. The information obtained from the literature review needed to address at a minimum one of the research questions, and it needed to be as current as possible. Altogether, over 40 different sources were utilized for the literature review.

Upon completion of the literature review a survey was developed for this research project, to provide insight on how other departments were accomplishing rapid damage assessment, what forms are they using and what elements the damage assessment should contain.

An email was sent to the Director of Membership Services of the Florida Fire Chiefs Association (FFCA), requesting that she distribute the survey to over 2000 FFCA members. The survey along with an explanation message located in Appendix N was sent via the Internet through

the FFCA website (www.ffca.org). This website is viewed by all members of the FFCA throughout the State of Florida. The names of the departments and respondents are provided in Appendix O.

The survey was designed to answer several questions; if the FFCA members departments questioned were conducting RDA, if they had a written policy and were using specific forms. Do they prioritize their critical infrastructure, do they train all their personnel in RDA, and do they believe RDA initially takes precedent over emergency calls, does their department have a written policy on RDA taking precedence over emergency calls and do they feel RDA is important. The final two questions inquired what type of jurisdiction and department they represented. The results were totaled and a percentage of yes and no answers were compiled for questions 1, 3, 4, 6, 7, 8, 9, 10 and 11. The finished survey and the results are located in Appendix P.

Assumptions and Limitations

The procedures utilized during this applied research paper were based on several assumptions and limitations. First, it is assumed that all literature reviewed was accurate and that the authors presented impartial and unbiased research.

Secondly, the population that completed the survey understood every question from the survey, and that all respondents answered all questions honest and without any partiality or bias. The survey was limited to only the 2000 plus members of the FFCA, and not sent to every jurisdiction in the State of Florida. It was also assumed that a response would be given from all FFCA members from around the state representing every fire rescue agency.

One limitation was that the survey was sent to all FFCA members, a department may have more than one member on the FFCA, and more than one survey could be returned from the same department.

An additional limitation was the time frames when the respondents were suppose to return the survey. The survey was emailed out close to two major holidays (Thanksgiving and Christmas), and following several hurricanes that had significantly impacted many portions of the State.

The findings of the survey were not based on scientific sampling. The survey represents a convenience sample of specific data that pertains to a rapid damage assessment program.

In addition to those limitations, the limited amount of practice by this writer in completing and compiling surveys is another.

Definition of Terms

Advanced Life Support (ALS). EMS personnel trained to use intravenous therapy, drug therapy, intubations and defibrillation.

ATC-20-1. Is a field manual for Post Earthquake Safety Evaluation of Buildings.

Career Fire Department. A department that utilizes full-time paid employees.

Comprehensive Emergency Management Plan (CEMP). The CEMP outlines the responsibilities and coordination mechanisms of County agencies, municipalities, and other taxing districts in a disaster.

Combination Fire Department. A department that is made up of career (full-time/paid) and volunteer (part-time/ not paid, or on call) personnel.

Community Emergency Response Team (CERT). A group that is organized and receives special training that enhances their ability to recognize, respond to and recover from a major emergency or disaster situation.

Company officer. A first-line supervisor in charge of a specific response unit and its personnel.

Emergency Medical Technician (EMT). A person that is certified and has successfully completed the U.S. Department of Transportation curriculum for EMT-Basic.

EMS. Emergency Medical Services. A complex health care system that provides immediate on scene patient care to those that are injured or suffering from an illness.

Emergency Operations Center (EOC). A pre-designated facility established by an agency or jurisdiction to coordinate the overall agency or jurisdictional response and support to an emergency.

First Due. The response area of a particular unit when they are in quarters.

Hurricane. A severe tropical cyclone with wind speeds in excess of 74 mph.

National Response Plan (NRP). Establishes a comprehensive all-hazards approach to enhance the ability of the United States to manage domestic incidents.

NFPA 1620. *Recommended Practice for Pre-Incident Planning*, 2003 edition.

Size-up. A systematic process of information gathering and situation evaluation that begins when an alarm is received (Jones and Bartlett).

Standard Operating Procedure (SOP). A written procedure for operations that are performed repeatedly.

Statewide Emergency Response Plan (SERP). A guide to assist in managing the types of devastation that occur in the state.

Target Hazard. A facility in which there is a potential likelihood of life or property loss from a fire (IFSTA).

Results

The researcher was searching for well-defined and detailed answers to the questions. The results of the literature review presented these answers for research question 1: The research presented some different terminology that was synonymous with RDA, like immediate damage assessment, initial damage assessment, and emergency damage assessment. The research offered

several definitions that were one and the same with RDA. Examples would be McEntire (2002) article that described the three types of damage assessment as rapid, which is completed quickly to grasp the damage from the disaster, … (p. 9), or Sarausad (1995) article where he stated "Emergency assessment as the word connotes is a rapid evaluation, at the soonest possible time" (p. 35). RDA is a quick evaluation of an area or building following a catastrophe.

The officials that have to make effective decisions about the deployment of resources, need to be properly informed. They must have accurate and timely information about what has happened, what needs to be done, and what resources are available. These decisions can save lives, minimize injury and damage, prevent secondary hazards (Asian Disaster Preparedness Center, 2000).

The results of the literature review presented these answers for research question 2: The literature review provided many articles on who should conduct a RDA. An immediate or initial damage assessment is generally completed by a first response agency such as the fire department (Cope and McEntire, 2004). Fire units can accomplish immediate damage assessments in their first due areas (EAFSOEM Student Manual, 2004). Strickland (1998) believed, that fire department personnel are the best-qualified personnel to perform an precise damage assessment.

The local government was responsible for conducting RDA immediately after the disaster (Horie, et al., 2003). Local governments should perform a RDA by surveying the disaster area. Typically, people used for this effort have included individuals with familiarity in assessment of homes and businesses, i.e. human services officers, building inspectors and tax assessors. In an article from the *Building Safety Journal* (2003) three-person damage assessment teams consist of a administrative professional, an architect, and a building inspector (p. 19). Local governments damage

assessment must be correct and immediate. The proper local and county officials should be properly trained in damage assessment (Kemp, 2003).

In the beginning, the local government is responsible for the emergency response, along with mitigation of the incident with resources on hand. The fire department is the primary level of protection when responding to disasters. To determine whether local resources can meet the needs imposed by a disaster, local officials must conduct a damage assessment when an incident occurs (SERP, 2005). The NRP (2005), also implies that, local jurisdictions respond using available resources and notify State representatives if the need for State assistance arises.

The results of the literature review presented these answers for research question 3: The results for this research question were developed from information collected from the survey. To answer this question the researcher was looking for information that primarily addressed how other fire departments were performing RDA. Pembroke Pines Fire Rescue has a SOP in place. The SOP (2005) states:

a. Rapid Impact Assessment to determine the amount of wind damage and standing water will be completed upon all clear and e-mailed or faxed to the Broward County EOC.
b. Rapid Impact Assessment to be completed 1 to 4 hours after all clear.
c. Fire Stations; Assess all stations for damage and document when the manpower is available after emergency search and rescue operations are under way. (p. 5)

This procedure addresses rescue/recon teams that rapidly assess the City's damage, to be completed in 6 hours or less. These teams will consist of personnel from several City departments. There are nine teams assigned to predetermined sections of the city. The primary function of the teams is initial damage assessment, and a secondary function is to remove small

amounts of debris to allow rescue units into areas where needed. The training division will provide annual training on the rescue/recon team, and this should be completed prior to the hurricane season (CGFR, 2003).

In Fort Lauderdale, Florida, the procedure of RDA is referred to as Rapid Impact Assessment or RIA. The county is broken down into ¼ mile grids, and each jurisdiction is responsible for managing and reporting the RIA information within their jurisdiction. The RIA assesses the extent of damage, the need to request for further assistance, and effective management of all county resources. Each fire station should conduct an RIA in the area around the station. The report should contain the name of the jurisdiction, grid number, and category of damage for flooding and wind. The categories range from 0, which is no damage to 4 that is catastrophic. The RIA should not take priority over emergency responses (FLFRD, 2003).

WPF&R conducts the Snapshot Assessment and Intermediate Assessment. The Snapshot is where the company officer completes a quick assessment of the personnel at the station, equipment at the station, the station itself and access to and from the station. Also, a rapid assessment of damage in the neighborhood, based upon a percentage of destruction of the immediate vicinity. The Intermediate assessment includes the needs and situations for critical infrastructures and takes priority over routine work (WPF&R, 2005).

The PFD training division ensures that disaster training is conducted, including damage assessment utilizing the snapshot form. PFD also conducts Disaster Assessment Snapshot and Intermediate Assessment. Snapshot Assessment is a preliminary assessment that includes reports of personnel, equipment, facilities and access to and from the facilities where the snapshot is conducted, along with a survey of conditions in the immediate area. The Intermediate Assessment is an assessment of the primary response area and its target hazards, and takes

priority over routine incidents (PFD, n.d.).

The PBCDEM has the IDIS, which is a quick windshield survey assessing damage to the community. County Fire-Rescue, municipal fire departments and the County's Planning, Zoning & Building Department will all conduct the IDIS. The personnel completing the IDIS compare damage to photographs (Appendix D) and definitions (Appendix E) for building, flooding and infrastructure damage (Palm Beach County, n.d.).

The IDIS program from Palm Beach County has not been utilized or recognized in the recent past by BRFRS. This was an unexpected finding when conducting the research for this ARP. This is a RDA or windshield survey to assess impact to the community.

The results of the literature review presented these answers for research question 4: To answer this question the researcher was looking for specific elements that RDA should contain. Particular needs that should be addressed by RDA include: possible need for emergency action; possible life safety threat and hazards to the public and response personnel; possible property, roadway and municipal services damage along with other unsafe conditions. The RDA should answer the questions: have deaths or injuries occurred, is it possible for injury or loss of life, is it unsafe, and what type and amount of emergency services are needed (EAFSOEM Student Manual, 2004).

Baseline data is in the form of maps, population statistic etc., is already available, it needs to be accessible, and updated frequently (Asian Disaster Preparedness Center, 2000). Damage assessment is not a one-time event it is a recurring procedure. As the local government response develops, the damage assessment information must be updated and completed frequently to ensure its accuracy (Cope and McEntire, 2004; Kemp, 2003).

In her, A Guide to Successful Damage and Needs Assessment, Plaintz (1999) wrote:

Every assessment process comprises of five elements or activities:

- Planning and preparation: assessments need thorough planning, design and preparation well in advance.
- Survey and data collection: the collection of data about the extent of damage caused by the disaster is the basis upon which decisions on relief and recovery are taken. Information gathering must proceed rapidly and thoroughly.
- Interpretation and forecasting: incoming assessment data has to be thoroughly analyzed and interpreted in order to become meaningful and useful for decision-makers.
- Reporting: information and results of the analysis process need to be disseminated in a format that enables disaster managers and decision-makers to formulate action programs.
- Monitoring: assessments must be seen as a continuous process of re-evaluating the needs and the appropriateness of response and recovery interventions. (p. 5-6)

The Coral Gables Fire Department rescue/recon teams have priorities and missions that are set up with the maps and SOP's that may be altered or updated during briefings when the teams are activated following the storm (CGFR, 2002).

The RIA used in Fort Lauderdale looks at the elements of wind and flood damage in four different categories. The categories range from 0 for no damage to 4 for catastrophic damage. Each damage category and the assessor's judgment should be used when conducting the RIA, and not all elements within a category description need to be observed (FLFRD, 2003).

WPF&R and PFD perform the snapshot survey that have the elements of personnel, equipment, facilities and access and are rated from 0 - minimal damage or injuries to 3 – major

damage or serious injuries. The neighborhood has scores that are 0 to 16 with 0 equivalent to no damage and 16 equal to complete destruction (WPF&R, 2005; PFD, n.d.).

The results of the literature review presented these answers for research question 5: Damage assessment forms should be produced and trained on prior to actually needing them. The forms should also be easy to use and provide accurate information. Utilizing the forms will help make the process of damage assessment easier and more precise (EAFSOEM Student Manual, 2004). Damage Assessment forms should use common terminology in a standard format since they are obtained from many sources and this will assist in the procedure of checking and comparing all of the damage assessment information. The forms should be designed to easily guide the person conducting the assessment (Asian Disaster Preparedness Center, 2000).

Edgewater Fire Rescue (EFR) uses three different forms for damage assessment the tally sheet (Appendix F) with damage totals broken down into three categories, the summary sheet (Appendix G) is used to total all tally sheets from the different zones established for the City, and a detailed damage assessment worksheet (Appendix H) that is more descriptive of building damage (EFR, n.d.).

PFD uses the Snapshot Survey (Appendix J) it indicates the percentage of damage in the vicinity, and the scores for the elements of personnel, units, facilities, and access (PFD, n.d.).

PBCDEM utilizes three forms; the IDIS Directions (Appendix K) which briefly state what information is needed, the Overall Damage Assessment Jurisdictional Survey (Appendix L) that indicates the status of target hazards, major roadways and developments, and the Primary Survey (Appendix M) of the personnel, equipment and apparatus and facilities (Palm Beach County, n.d.).

In addition to answering the research questions, a survey was completed. The survey was intended to evaluate and differentiate the findings from the literature review. The survey was developed to ascertain if the departments questioned are performing RDA, identifying any written policies, see if the departments were utilizing specific forms, and where the forms are carried. It was also designed to determine if the departments prioritized their critical infrastructures, if they trained on RDA, if they believed RDA took precedence over emergency calls, and if there was written policy on the priority of RDA. The survey also established if the jurisdiction was divided for management of RDA, and if they felt RDA was important. The type of department and type of jurisdiction were also identified. The final question of the survey asked for any additional comments or suggestions. The results of the survey provided answers to research question 3, 4 and 5.

The results of the survey (Appendix P) identified how other fire departments were conducting RDA. There were 48 surveys returned out of a possible 2000 for a 2.4% participation rate. No attempt was made to contact any of the non-respondents. Out of the 48 surveys returned 32 (65%) were representing career departments, 12 (25%) were from combination departments, and 2 (4%) were from volunteer fire departments. Twenty-five (51%) clarified their departments as protecting an urban area, 25 (51%) protected a suburban area, and 14 (29%) protected a rural area. Several of the respondents were county services and answered this question as protecting more than one type of jurisdiction.

There were 38 (79%) of the departments surveyed that indicated they conducted RDA while 8 (17%) stated they did not perform RDA. Of the departments that indicated they did not conduct RDA 8 (100%) stated their building department did, 1 (13%) stated their police department conducted the RDA, 9 (125%) stated other departments conducted the RDA. Again, several

departments answered multiple answers, due to the fact they conducted RDA along with other city departments as well. In addition, 2 (4%) did not answer because they did not work for fire departments at this time.

The respondents were then asked if their departments have a written policy on conducting RDA 17 (35%) answered yes, 29 (60%) answered no. The following question asked if their department utilized specific forms when performing RDA, 25 (52%) stated yes that they used forms, and 21 (44%) did not use specific forms. Those surveyed were asked where are the plans carried, 6 (24%) stated on the apparatus, 13 (52%) answered in the station, 15 (60%) stated on computers, and 6 (24%) stated other places with no description. Several of the respondents choose more than one answer.

Another question asked if their department prioritized the critical infrastructures, 32 (67%) answered yes, 14 (29%) answered no. The subsequent question asked do you train all personnel, 20 (42%) answered yes, 26 (54%) answered no. The ensuing question asked if they believe that RDA takes precedence over emergency calls, 8 (17%) stated yes, 38 (79%) stated no. The respondents were then asked if their department's written policy had RDA taking precedence over emergency calls for assistance, 3 (6%) answered yes, and 43 (90%) answered no.

The survey then asked if their jurisdiction were divided for the management of RDA, 32 (67%) answered yes, and 14 (29%) answered no. Another question asked do you feel RDA is important, 46 (96%) stated yes, 2 (4%) did not answer because they did not work for fire departments at this time.

The final question of the survey asked for comments or suggestions. Five stated they were in the process of updating or upgrading their SOP and RDA program this year. Six respondents sent

copies of their written policies, and three returned copies of the forms they use for damage assessment. Finally, there were many surveys returned with no comments.

An SOP was developed for a RDA program. This program includes a Snapshot survey from a station keeper or station officer, also from the officer in charge of a shelter. The program also incorporates a RDA of the neighborhood and of target hazards in each fire unit's primary response area. All personnel including the Fire Chief for his approval will review this program.

Discussion

The purpose of this ARP as stated previously, was to offer recommendations on a RDA program and to suggest the steps necessary to create the needed change for BRFRS. Based on the results from the research, it indicates that there is a need for a RDA program for all jurisdictions throughout the fire service and in particular BRFRS.

The first research question wanted a definition of RDA and explanation of why it is important. Damage assessment is information gathered about a defined area following the impact of an event, or series of events, on life and property. Immediate damage assessment is a rapid estimate of damage inside the incident area. More emphasis is placed on the immediate damage assessment or RDA so the right amount and type of resources can be deployed for assistance (EAFSOEM Student Manual, 2004). To make effective decisions about the deployment of resources they need appropriate and timely information about what has happened, what needs to be done, and what resources are available. The decisions made can save lives, minimize injury, minimize damage and loss, prevent escalation, and prevent secondary hazards (Asian Disaster Preparedness Center, 2000). The importance of RDA is critical in the response to a disaster incident, not only for the emergency response but also for the recovery phase. The assessment will provide the decision makers the

necessary information about the incident to provide an efficient and effective response to emergencies.

Subsequently, the next research question asked who should conduct RDA. Initial damage assessment is generally completed by a first response agency such as the fire department (Cope and McEntire, 2004). Fire units can complete immediate damage assessments in their first due or primary areas or districts. The emergency responding agencies can share the responsibility for conducting RDA (EAFSOEM Student Manual, 2004). Strickland (1998) stated the most rational and top qualified personnel to execute an accurate damage assessment are fire department officials.

The SERP (2005) has four levels of response: local, county, state and federal. Initially the local government will have responsibility of the emergency response and assistance, along with mitigation of the incident with resources on hand at the local level. The local Fire-Rescue agency is the primary level of protection when responding to disasters. The local jurisdiction is responsible for responding to a significant incident utilizing available resources. As information emerges, they must assess the situation and determine the need for further assistance NRP (2005).

Local governments should perform a RDA by surveying the disaster area. The RDA information lays the foundation for determining immediate response needs. Who better to perform the RDA than the fire department, since they are already strategically placed throughout their jurisdictions.

The third research question sought how other departments are successfully performing RDA. The results of the survey revealed that a majority of departments' surveyed conduct a RDA while a small minority does not. Many of those departments perform a windshield or snapshot survey. In Coral Gables, they assemble rescue/recon teams that rapidly assess the City's damage in 6 hours or less (CGFR, 2003). In Fort Lauderdale, Florida, the procedure of

rapid damage assessment is referred to as Rapid Impact Assessment or RIA. The RIA is designed to assess the extent of damage, assess the need to request for further assistance, and to assist in effective management of all county resources (FLFRD, 2003). WPF&R and PFD conduct a Snapshot Assessment and an intermediate assessment. The Snapshot is a quick assessment of the personnel at the station, equipment at the station, the station itself and access to and from the station, and includes a rapid assessment of damage in the neighborhood, based upon a percentage of destruction of the immediate vicinity (WPF&R, 2005; PFD, n. d.). PBCDEM created the IDIS which is a quick windshield survey assessing the damage to the community (Palm Beach County, n.d.).

The fourth research question sought what elements should the RDA contain. The RDA must address specific needs or concerns; the primary concern is to facilitate a jurisdiction's response and recovery from a disaster. The RDA must satisfy the following four questions: Have deaths or injuries occurred? Is there a potential for injury or loss of life present? Are there unsafe conditions? Are emergency services required? (NFA, 2004).

Damage assessment is a recurring procedure, not a one-time event (Cope and McEntire, 2004, p. 7). According to Kemp (2003) as the local government response develops, the damage assessment information must be updated and confirmed frequently to ensure its accuracy. Planitz (1999) stated that every assessment process consists of five elements, which include planning and preparation, survey and data collection, interpretation and forecasting, reporting, and monitoring.

The last research question sought what forms should BRFRS use. The forms need to be created before they are needed. In the design and development of the forms simplicity should be the key component. Damage assessment forms should be produced and trained on prior to

actually needing them. The forms should also be easy to use and provide accurate information. Utilizing the forms will help make the process of damage assessment easier and more precise (EAFSOEM Student Manual, 2004, p. SM 6-9).

All personnel must be trained in the use of the form and in RDA. Over half of the respondents that acknowledged that they perform RDA, train their personnel on the assessment process.

Natural and manmade disasters are impacting virtually every community in the United States. Boca Raton is no exception they have experienced varying levels of disaster in the past, both manmade and natural. From anthrax at the AMI building to the four hurricanes in the past two years, the need is present for a more proactive approach with damage assessment. Whether it is a civil disturbance, explosion, fire, hazardous materials incident or a terrorist attack, any one would cause a major disaster and require the mobilization of many City resources. The Fire Department is in the forefront with protecting the lives and properties of the citizens of Boca Raton. For that reason, it is important to respond and evaluate the damage caused, and the needs of citizens after a disaster.

More and more people are choosing to live, work and vacation in Boca Raton, regardless of the risks the area faces. An increase in population means an increase in economic development, which creates a city with more to lose. So whether a manmade or natural disaster occur either more frequently or sporadically, the City of Boca Raton must remain vigilant on the ability to accurately depict the impact of a disaster through the use of a RDA. The 21st century is the most dangerous time for the fire service to deal with emergencies; every tool at your disposal must be utilized.

The results clearly demonstrated that there are many ways to perform RDA, and the need for a RDA program. The development of a program should incorporate a combination of the current

IDIS program, and that of the snapshot or windshield survey. The results of the survey reinforce the literature review and this writer's opinion that a RDA program is of importance for BRFRS. One hundred percent of the respondents surveyed (excluding the two that are not working for fire departments), acknowledged that, a RDA program was important. In addition, seventy-nine percent of the respondents surveyed conduct some type of RDA program.

The organizational implications for BRFRS are that there is a need for a RDA program. A RDA program will increase the effectiveness, efficiency, and safety of the services that BRFRS provides to its internal and external customers. This research paper has presented the information necessary in implementing RDA program for BRFRS.

Recommendations

The problem as already stated was that the BRFRS does not make use of an official RDA program. The fire service today has progressed into a more proactive, rather than a reactive organization in many facets. The purpose of this ARP as stated previously, was to offer recommendations on a RDA program and to suggest the steps necessary to create the needed change for BRFRS.

Based on the research presented in this study a need has been verified that BRFRS shall implement a RDA program. In accordance with the findings from the literature review, surveys and the study of these findings, the following recommendations have been designed.

- BRFRS should evaluate the draft SOP (Appendix Q) on damage assessment, which is a product of this research.
- BRFRS should evaluate the draft RDA program (Appendix R) that is also a product of this research.

- A committee should be formed to list target hazards broken down by station run areas.
- After evaluation is complete by department personnel, area departments should review the SOP and RDA program for further evaluation.
- Based on all feedback externally and internally, final drafts should be put together.
- The final product should be included into the *City of Boca Raton Emergency Preparedness Plan*.
- The final product should be sent to BRFRS Training & Safety Division for distribution, training, and implementation.
- After completion and implementation of RDA program, the program should be continually evaluated and modified when corrections are required.
- Further research should be conducted on a preliminary damage assessment program to follow the RDA. This should be a joint program with other City Departments.

The RDA program should be implemented as soon as possible. The approval for the project, training of the program, and implementation will take approximately 4 months to 6 months. Unfortunately, the 2006 hurricane season is rapidly approaching, with due diligence the program should be completely implemented by the full swing of the hurricane season.

As leaders in the fire service today it is imperative that we encourage all members of the fire service regarding the value of RDA. Smith (1998) stated, “If we don’t plan for emergencies, we cannot deal with them effectively. … Once problems are identified, the way has been paved for successful emergency operations” (p. 22).

In conclusion, future readers of this ARP should understand that proper training and a well-planned RDA program will help BRFRS and the community to meet the challenges of

today and tomorrow in regards to disaster response and recovery. This will help ensure that both internal and external customers receive the best and safest possible service. For the RDA program to succeed, all members of BRFRS, or any other department that institutes a RDA program will need all its members to endorse the program completely. By looking beyond to the potential of injuries and or deaths to civilians and or firefighters from a disaster, either manmade or natural, we must be as prepared as possible for the present.

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Appendix A

Miami Fire Rescue Emergency Damage Assessment Card

Appendix B

Broward Sheriffs Office Snapshot Damage Assessment Form

Appendix C

Neighborhood Damage Assessment Entry Form
To submit a Damage Report follow these steps:

1 **Report the address**
Write the address starting with the house number and following with the direction prefix, street name, street type post direction suffix, city and zip code .

Notice that the direction prefix and direction suffix as well as the street type must be selected from the corresponding drop down list.

House number: | Direction: | Street Name: | Street Type | Dir. Suffix:
none | none

City: | Zip:

2 **Select the Damage/Flood Level**
From the Damage Level Pictures 1 though 4 shown below, choose the Damage Level and/or Flood Level Number that more closely resembles the damage in the address you are reporting. Then find the number in the Damage and/or Flood level drop down list.

The Flood Level is indicated by the numbers 5 and 6 shown only in picture 1, but it can be also applied to pictures 2, 3, and 4. Flood level 5 demonstrates street flooded or water level onto the property but outside the home, while flood level 6 demonstrates water level inside the home.

The pictures 1 through 4 can be enlarged by clicking with the mouse on them.

Damage level: Select a Damage level

Flood level: Select a Flood level

3 **Submit your Neighborhood Damage Report**
Please submit your Neighborhood Damage Report by clicking the SUBMIT button. **Thank you for your cooperation!**

Submit

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E-mail your comments, questions and suggestions to Webmaster
This page was last edited on: July 19, 2005

Website
? 2004 Miami-Dade County.
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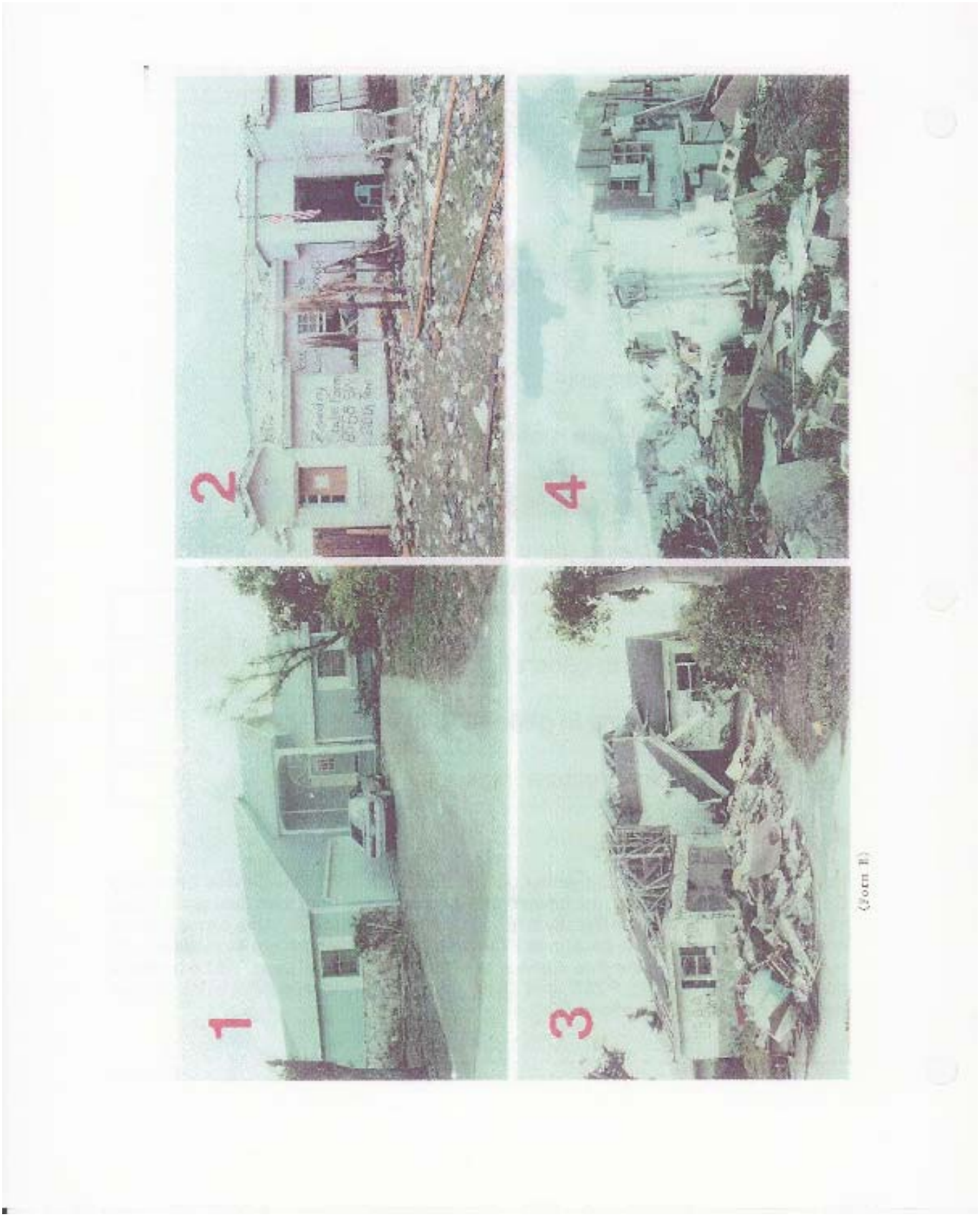
Miami-Dade Online Form

Appendix D



Palm Beach County, Initial Damage Impact Survey Photographs

Appendix E

DAMAGE ESTIMATE DEFINITIONS

The damage estimate should be considered based on the following definition. The level of damage should be identified by the number that best describes the level of damage sustained on average within your response area.

BUILDING DAMAGE

1	Low	Minor damage to roof coverings and/or accessory structures such as screen enclosures, awnings, etc. Minor debris and tree limbs in roads, all roads all open.
2	Moderate	Structures are basically intact with the exception of roof coverings and wall siding, shutters, missing or damaged. Some debris, utility lines down with minor random street flooding. Secondary roads are impassable due to debris, utility poles/lines and/or trees and flooding, Major roads have limited access.
3	High	Portions of roof missing and structure open to the weather, walls mostly intact with the exception of openings, extensive damage to accessory structures. Secondary roads are impassable due to debris, utility poles/lines and/or trees and flooding, Major roads have limited
4	Extensive	Roof and/or walls missing and open to the weather, buildings and accessory structures destroyed. Major roads and bridges are impassable due to debris, utility poles/lines and/or trees, flooding and erosion.

FLOODING DAMAGE

1	None	May have minor street and yard flooding. Minor debris and tree limbs in roads, all roads all open.
2	Low	Will have random street and yard flooding. Minor debris and tree limbs in roads, all roads all open.
3	Moderate	Roads may be impassable, flooding in buildings water may still be in some buildings.
4	Extensive	Roads are impassable, flood waters are standing in buildings.

INFRA-STRUCTURE DAMAGE

1	None	Minor debris and tree limbs in roads, all roads all open.
2	Low	Some debris, utility lines down with minor random street flooding.
3	Moderate	Secondary roads are impassable due to debris, utility poles/lines and/or trees and flooding, Major roads have limited access.
4	Extensive	Major roads and bridges are impassable due to debris, utility poles/lines and/or trees, flooding and erosion.

(Form C)

Palm Beach County, Initial Damage Impact Survey Definitions

Appendix F

Windshield Verification Tally Sheet Edgewater Fire/Rescue Page _____ of _____

Street Name: _____ Date: _____ Zone: _____ Type of Disaster: _____

Area Boundaries: North _____ South _____

East _____ West _____

	Single Family Dwellings	Mobile Homes	Manufactured Homes	Apartments	Business	Public	Totals
DESTROYED	Total	Total	Total	Total	Total	Total	
MAJOR	Total	Total	Total	Total	Total	Total	
MINOR	Total	Total	Total	Total	Total	Total	
	Totals	Totals	Totals	Totals	Totals	Totals	Grand Total

Tally example: 𝍸 = 5. One diagonal mark for every five dwellings, mobile homes, manufactured homes, apartments, businesses or public buildings.

Edgewater Fire Rescue Verification Tally Sheet

Appendix G

Windshield Verification Summary Sheet — Edgewater Fire/Rescue

Date: _____ Zones: 1 thru 6 Type of Disaster: _____

	Single Family Dwellings			Mobile Homes			Manufactured Homes			Apartments			Business			Public		
	Dest. 3	Major 2	Minor 1	Dest. 3	Major 2	Minor 1	Dest. 3	Major 2	Minor 1	Dest. 3	Major 2	Minor 1	Dest. 3	Major 2	Minor 1	Dest. 3	Major 2	Minor 1
ZONE 1																		
ZONE 2																		
ZONE 3																		
ZONE 4																		
ZONE 5																		
ZONE 6																		
TOTALS																		

Edgewater Fire Rescue Verification Summary Sheet

Appendix H

EDGEWATER FIRE/RESCUE ON-SITE DETAILED DAMAGE ASSESSMENT WORKSHEET Page ___ of ____

Type of Disaster _____ Date _____ Street Name_____ Zone _____

OCCUPANTS NAME	STREET NUMBER	BLDG. DAMAGE 3 DESTROYED	2 MAJOR	1 MINOR	0 NO DAMAGE	DAMAGE $ VALUE	HAZARDS: POWER OUT	FIRE	GAS LEAK	WATER LINE	CHEM LEAK	PEOPLE: IMMEDIATE	RELOCATED	DEAD	ROADS: BLOCKED	WATER IN CAR	TAKES	VEHICLES	NEEDS SHELTER #	DESCRIPTION OF DAMAGE
							N	Y	Y		Y				Y		Y	Y		
TOTALS																				
	SINGLE																			
	MOBILE																			
	MANUFACT																			
	APTMENT																			
	TOTAL THIS PAGE																			
	BUSINESS																			
	PUBLIC																			

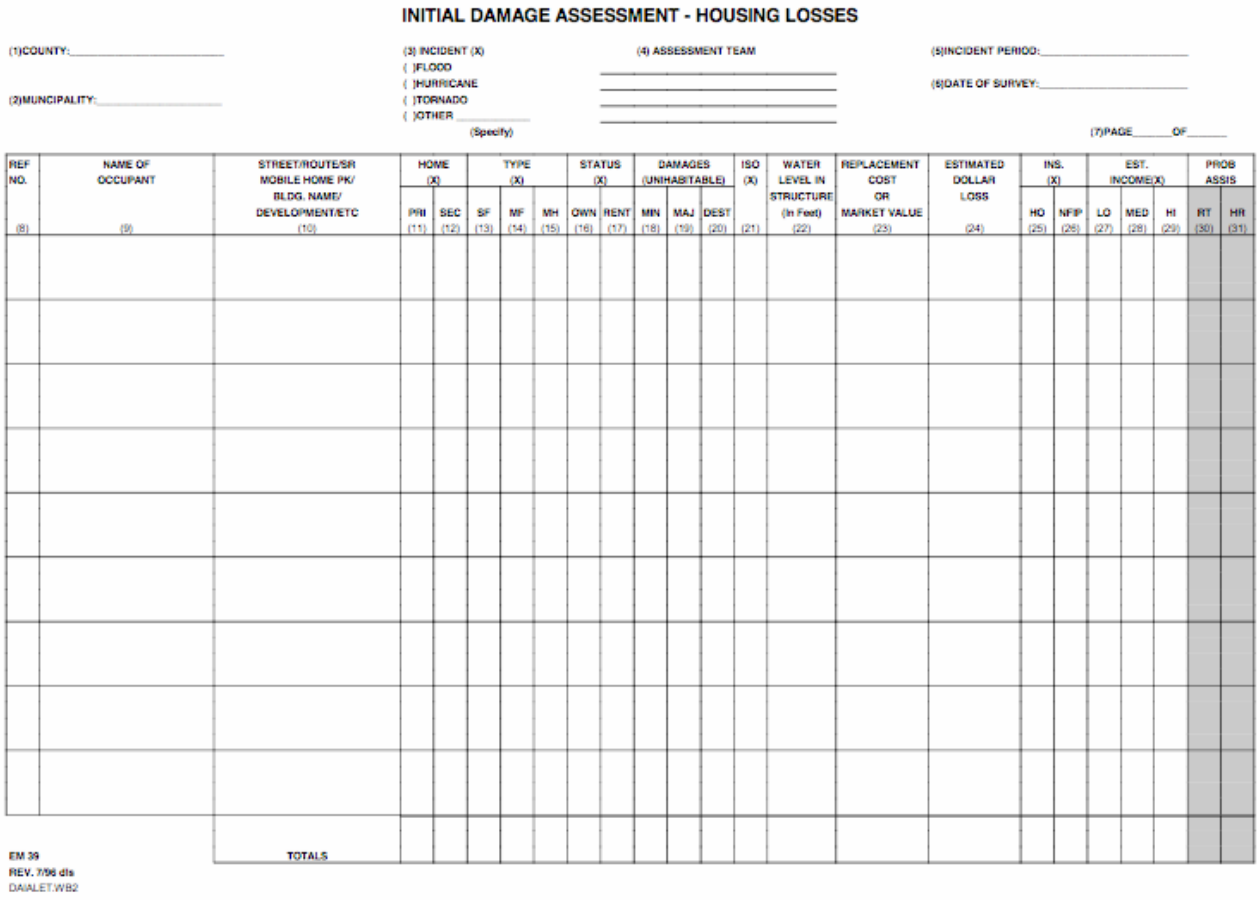
S = SINGLE FAMILY HOME
M = MOBILE HOME
MF = MANUFACTURED HOME
A = APARTMENT
B = BUSINESS
3 = DESTROYED = NOT REPAIRABLE
2 = MAJOR = NOT HABITABLE = NEEDS REPAIR
1 = MINOR = HABITABLE
0 = NO DAMAGE

ZIP CODE _____

WORKER'S NAME (PRINT)

Edgewater Fire Rescue Detailed Damage Assessment Worksheet

Appendix I



INITIAL DAMAGE ASSESSMENT - HOUSING LOSSES

(1)COUNTY:_____

(2)MUNICIPALITY:_____

(3) INCIDENT (X)
( )FLOOD
( )HURRICANE
( )TORNADO
( )OTHER _____
(Specify)

(4) ASSESSMENT TEAM
_____
_____
_____
_____

(5)INCIDENT PERIOD:_____

(6)DATE OF SURVEY:_____

(7)PAGE_____OF_____

REF NO. (8)	NAME OF OCCUPANT (9)	STREET/ROUTE/SR MOBILE HOME PK/ BLDG. NAME/ DEVELOPMENT/ETC (10)	HOME (X)		TYPE (X)			STATUS (X)		DAMAGES (UNINHABITABLE)			ISO (X) (21)	WATER LEVEL IN STRUCTURE (In Feet) (22)	REPLACEMENT COST OR MARKET VALUE (23)	ESTIMATED DOLLAR LOSS (24)	INS. (X)		EST. INCOME(X)			PROB ASSIS	
			PRI (11)	SEC (12)	SF (13)	MF (14)	MH (15)	OWN (16)	RENT (17)	MIN (18)	MAJ (19)	DEST (20)					HO (25)	NFIP (26)	LO (27)	MED (28)	HI (29)	RT (30)	HR (31)
		TOTALS																					

EM 39
REV. 7/96 dls
DAIALET.WB2

Indian River County Fire Rescue Residential Loss Form

Appendix J

PENSACOLA FIRE DEPT. DAMAGE ASSESSMENT "SNAPSHOT"

BOX NUMBER(S)

	NO DESTRUCTION EQUALS "0"	25 PERCENT	50 PERCENT	75 PERCENT	100 PERCENT
PERCENTAGE	25 PERCENT	1	2	4	6
OF	50 PERCENT	2	4	6	8
STRUCTURES	75 PERCENT	4	6	8	10
	100 PERCENT	6	8	10	16

SNAPSHOT SCORE _____ FLOODING _____ FEET

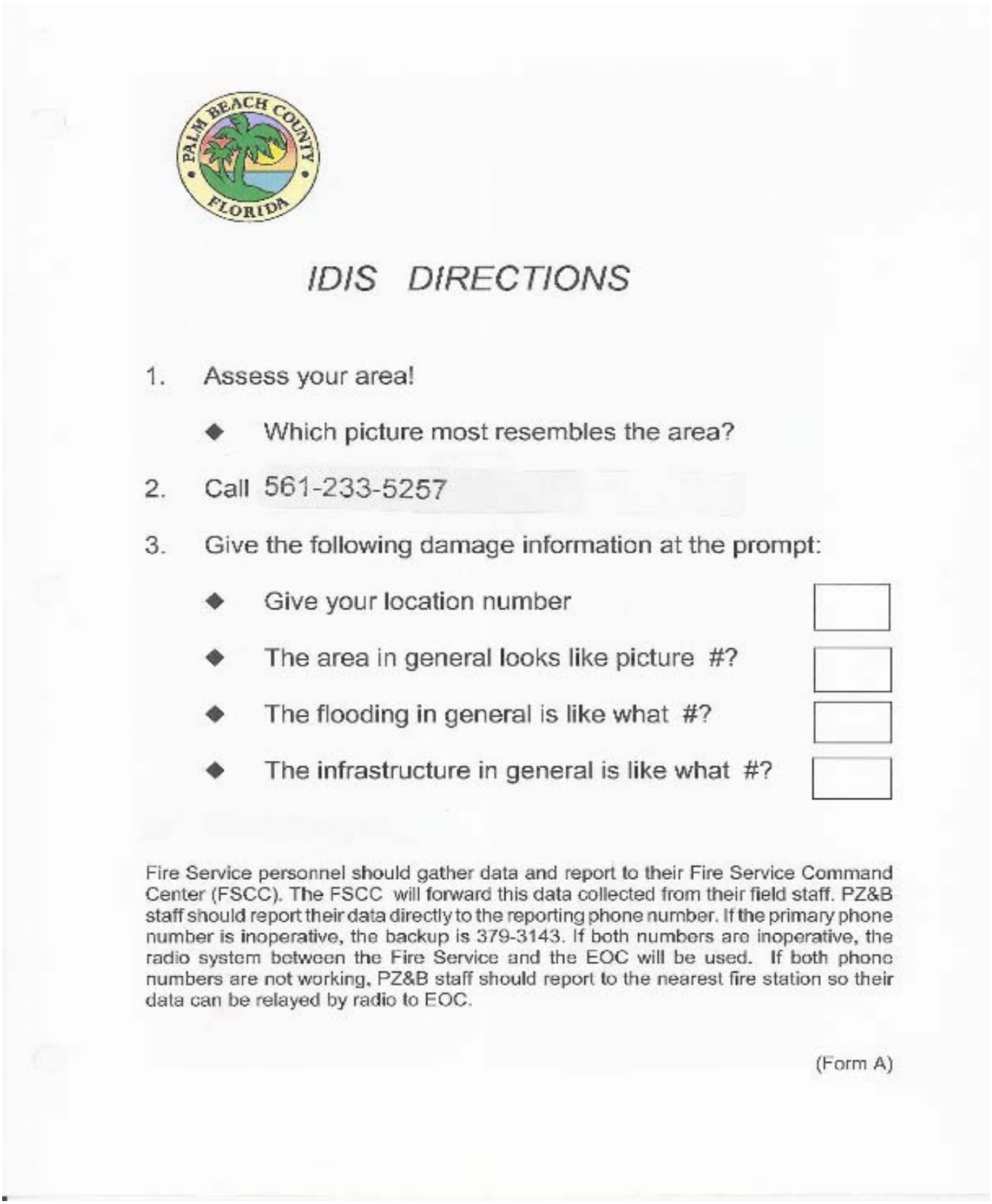
PERSONNEL _____ (1=No injuries; 2= Minor Injuries; 3=Serious Injuries, STATE SPECIFICICS)

RESPONSE UNITS _____ (1=All in Service; 2= In Service, needs repair; 3=Out of Service, state specifics)

FACILITY _____ (1=minimum Damage; 2=Serious Damage; 3=Uninhabitable)

ACCESS _____ (1=Clear; 2= Minimum blockage; 3=Major Blockage)

Appendix K



PALM BEACH COUNTY FLORIDA

IDIS DIRECTIONS

1. Assess your area!
   - Which picture most resembles the area?
2. Call 561-233-5257
3. Give the following damage information at the prompt:
   - Give your location number ☐
   - The area in general looks like picture #? ☐
   - The flooding in general is like what #? ☐
   - The infrastructure in general is like what #? ☐

Fire Service personnel should gather data and report to their Fire Service Command Center (FSCC). The FSCC will forward this data collected from their field staff. PZ&B staff should report their data directly to the reporting phone number. If the primary phone number is inoperative, the backup is 379-3143. If both numbers are inoperative, the radio system between the Fire Service and the EOC will be used. If both phone numbers are not working, PZ&B staff should report to the nearest fire station so their data can be relayed by radio to EOC.

(Form A)

Palm Beach County, Initial Damage Impact Survey Directions

Appendix L

FIRE DEPARTMENT
JURISDICTIONAL SURVEY
OVERALL DAMAGE ASSESSMENT

Status of Target Hazards — **Structural Damage**

Address	Target Hazard	None 0	Low 1	Mod 2	High 3	Exten. 4

Status of Major Routes — **Flooding and Infra-Structure**

Roadway	Cross Street	None 0	Low 1	Mod 2	High 3	Exten. 4

Status of Developments — **Structural Damage**

Development Name	Map Page	None 0	Low 1	Mod 2	High 3	Exten. 4

Completed By:_____ Station_____ Date_____

Palm Beach County, Initial Damage Impact Survey Overall Damage Jurisdictional Survey

Appendix M

PRIMARY SURVEY

Status of Personnel

Employee Name	Assignment / Shift	No Injuries	Minor Injuries	Serious Injuries

Status of Equipment and Apparatus

Equipment / Apparatus	Asset #	In Service	Needs Repair	Out of Service

Status Structural Damage to Station

Address	Station #	None 0	Low 1	Mod 2	High 3	Exten 4

Completed By:_____ Station_____ Date_____

Palm Beach County, Initial Damage Impact Survey Primary Survey

Appendix N
Cover Letter and Survey

November 19, 2005

Hello,

My Name is Daryl Scott; I am a Division Chief with Boca Raton Fire Rescue Services. I am currently enrolled in the National Fire Academy's, *Executive Fire Officer Program (EFOP).* I have completed my third course in the EFOP, *Executive Analysis of Fire Service Operations in Emergency Management* and in the process of writing an applied research paper. My paper is on the following topic: *Creating and Implementing a Rapid Damage Assessment Program for Boca Raton Fire Rescue Services.*

I would ask that you, or someone that you designate, please take the time out of your busy day and complete this survey and return it to me by December 23, 2005 either by email at **dscott@ci.boca-raton.fl.us**; by fax at (561) 995-2103, or mail to the following address:

Division Chief Daryl Scott
Boca Raton Fire-Rescue Services
2333 W. Glades Rd.
Boca Raton, FL 33431-7311

The information compiled by this survey will be combined with information from other departments from around the State. The compiled information will then be used to complete the research. Again, thank you for your assistance in taking the time to complete this survey.

Damage Assessment Survey

1. Does your Department conduct rapid damage assessments following a natural or manmade disaster? Yes _____ No _____
2. If no, who conducts the rapid damage assessments?
   ___ Building Department
   ___ Police Department
   ___ Other – (please specify) _____
3. Does your fire department have a written policy on conducting rapid damage assessment? Yes _____ No _____ if yes can a copy of the policy be sent with the survey.

4. Are there specific forms that are utilized when performing rapid damage assessment? Yes _____ No _____ if yes can a copy of the forms be sent with the survey.
5. Where are your forms carried or stored? Apparatus ____, Station _____, Computer ____, Other _____
6. Does your fire department prioritize the critical infrastructures located within your jurisdiction for performing damage assessment? Yes _____ No _____
7. Do you train all personnel on conducting rapid damage assessment? Yes_____ No_____
8. Do you believe that rapid damage assessment initially takes precedent over responding to emergency calls? Yes _____ No _____
9. In your fire department's written policy, is rapid damage assessment a priority over emergency calls for assistance? Yes _____ No _____
10. Is your jurisdiction divided for the management of rapid damage assessment? Yes _____ No _____
11. Do you feel rapid damage assessment is important? Yes_____ No_____
12. What type of jurisdiction do you protect? Urban _____, Suburban _____, Rural _____
13. What type of Fire Department do you represent? Career _____, Combination _____, Volunteer _____

Please fill in the following information:

Name of Department: _____

Name and Rank: _____

E-mail address: _____

Phone Number: _____

Additional comments/suggestions _____

_____

_____

_____

Thank you again for participating in this survey!

Appendix O

Department Name	Name/Rank
Lynn Haven Fire & Emergency Services	John Massimiani, Captain
City of Chiefland	David Burnett, Fire Chief
Tampa Fire Rescue	Emilio F. Salabarria, Captain
Plant City Fire Rescue	George Shiley, Fire Chief
City of Winter Park Fire & Rescue	James White, Fire Chief
Delray Beach Fire Rescue	Robert Moreland, Division Chief
Gainesville Fire Rescue Dept	Lesa Holder, Senior Staff Assist
Bayshore Fire Rescue	Chad Jorgensen, Fire Chief
West Manatee Fire Dept	Dennis Dotson, Battalion Chief
Madeira Beach Fire Dept	Derryl O'Neal, Fire Chief
Miami-Dade Fire Rescue	Roberto Suarez, Safety Chief
Fort Lauderdale Fire Rescue Dept	Jo-Ann Lorber, Lieutenant
Indian River County Fire Rescue	Dale Justice, Bureau Chief - Fire Prevention
Estero Fire	Mike Cato, Fire Marshal
Charlotte County Fire/EMS	Verne E. Riggall, Deputy Chief Special Ops
Coral Gables Fire Dept	Rick Cook, Fire Chief
Reedy Creek Improvement	Tim Moore, Deputy Chief
Iona-McGregor Fire District	John Spicuzza, Division Chief
Broward Sheriff Office Dept of Fire Rescue & Emergency	Todd LeDuc, Deputy Fire Chief
Seminole County	George Bessler
Big Corkscrew Fire Control & Rescue District	Michael T. Ginson, A/C
Plant City Fire Rescue	Eugene Shuler, Division Chief
Lighthouse Point Fire Rescue	David Harlow, Fire Chief
Putnam County Dept of Emergency Services	Michael Patterson, EMS Manager/ Deputy Chief
Hardee County Emergency Management	Richard Shepard, EM Director
Pensacola Fire Dept	James Dixon, Fire Chief
Big Corkscrew Fire Control & Rescue District	Rita Greenberg, Fire Chief
Tamarac Fire Rescue	Jim Budzinski, Fire Chief
Boynton Beach Fire Rescue Dept	William L. Bingham, Fire Chief
Dunnellon Fire Dept	Joe Campfield, Fire Chief
Five Points VFD	Myron Pearce, Chief
Winter Park Fire Rescue Dept	Brian R. Dean, A/C Operations
Coral Gables Fire Dept	Marc Stolzenberg, Division Chief
Iona-McGregor Fire District	Greg MacKenzie, Division Chief
Hillsborough County	Frank Fernadez
Abercrombie & Forestry - Suppliers	Brigg Abercrombie
Tampa Fire Rescue	Scott Ehlers, Chief of Special Ops
Miramar Fire Rescue	Joe Cabrera, Deputy Chief
Boca Raton Fire Rescue	John Johnson, Acting Deputy Chief
City of Clermont Fire Department	Paul Anderson, Captain
City of Port Orange Dept of Fire Rescue	Christopher J. Weir, Division Chief
City of St. Cloud Fire Rescue	A. Macalister
City of Edgewater Fire Rescue	Tracey T. Barlow, Fire Chief
Pembroke Pines Fire Rescue	Shawn Gilmanton, Division Chief
Gainesville Fire Rescue Dept	Lesa Holder, Senior Staff Assist
City of Miami Fire Rescue Dept	Tom Flores, Assistant Chief
Islamororada Fire Rescue	Geo Toth, Lieutenant

Department Names & Respondents for Survey

Appendix P

Damage Assessment Survey Results

1. Does your Department conduct rapid damage assessments following a natural or manmade disaster? Yes **38 (78%)** No **8 (16%)**
2. If no, who conducts the rapid damage assessments?
   8 (100%) Building Department
   1 (13%) Police Department
   9 (125%) Other – (please specify) _____
3. Does your fire department have a written policy on conducting rapid damage assessment?
   Yes **17 (35%)** No **29 (60%)** if yes can a copy of the policy be sent with the survey.
4. Are there specific forms that are utilized when performing rapid damage assessment?
   Yes **25 (52%)** No **21 (44%)** if yes can a copy of the forms be sent with the survey.
5. Where are your forms carried or stored? Apparatus **6 (24%)**, Station **13 (52%)**, Computer **15 (60%)**, Other **6 (24%)**
6. Does your fire department prioritize the critical infrastructures located within your jurisdiction for performing damage assessment? Yes **32 (67%)** No **14 (29%)**
7. Do you train all personnel on conducting rapid damage assessment? Yes **20 (42%)** No **26 (54%)**
8. Do you believe that rapid damage assessment initially takes precedent over responding to emergency calls? Yes **8 (17%)** No **38 (79%)**
9. In your fire department's written policy, is rapid damage assessment a priority over emergency calls for assistance? Yes **3 (6%)** No **43 (90%)**
10. Is your jurisdiction divided for the management of rapid damage assessment?
    Yes **32 (67%)** No **14 (29%)**
11. Do you feel rapid damage assessment is important? Yes **46 (96%)** No **answer 2 (4%)**
12. What type of jurisdiction do you protect? Urban **25 (51%)**, Suburban **25 (51%)**, Rural **14 (29%)**
13. What type of Fire Department do you represent?
    Career **32 (65%)**, Combination **12 (25%)**, Volunteer **2 (4%)**

Additional comments/suggestions _____

_____

_____

_____

Boca Raton Fire Rescue Services *Standard Operating Procedure* _____ _____ **Fire Chief Signature** **Date**	***S.O.P. #: 502*** Effective: Revised: Page: 1 of 1

Division: Operations

Subject: Rapid Damage Assessment

Reference*:*

Policy: The department will use effective rapid damage assessment practices as a tool designed to minimize life and property loss or damage and return public property to an operable condition as quickly as possible.

Scope: *All personnel*

Purpose:

The Boca Raton Fire Rescue Services Rapid Damage Assessment Program is a tool designed to conduct an initial evaluation following a disaster to give early information on the extent of damages. This information is imperative to ensure that resources are utilized where they are most needed. This survey is a quick windshield survey to assess the overall impact on the community. The overall goal is to obtain timely, uniform and consistent information. This action should take priority over routine work. This program will be utilized in conjunction with the Palm Beach County Initial Damage Impact Survey from the Palm Beach County Division of Emergency Management.

Procedure:

Snapshot Survey

Immediately following the end of the incidence, the station keeper and the officer in charge at the shelters shall conduct a “Snapshot Survey” of the personnel, equipment, facilities and access to and from the facility at which they are located, along with an evaluation of the amount of flooding in the immediate area. This information should be compiled and documented on the Snapshot Survey Form. This information should then be reported to the Fire Department EOC via fax, phone or radio.

Rapid Damage Assessment

The Rapid Damage Assessment is a very quick survey to determine the overall amount of damage sustained in your primary run area, and to identify the support and resources that will be needed for that particular area. Rapid damage assessment is to be completed I to 4 hours after all danger has passed. This information should be compiled and documented on the Overall Rapid Damage Assessment Form. This information should then be reported to the Fire Department EOC via fax, phone or radio.

Boca Raton Fire Rescue Services

Rapid Damage Assessment Program

12/20/05

Snapshot Survey

Each station keeper and officer in charge at shelters shall conduct a snapshot survey at his/her location immediately following the event, weather and environment permitting. The following key elements will be evaluated:

PERSONNEL
The physical condition of each person listed at the location.

1. = No injuries
2. = Minor injuries
3. = Serious injuries / explain specifics about injuries and any action being taken

EQUIPMENT
The condition of all the response units at your facility, particularly their ability to respond.

1. = All in service
2. = In service but need repairs / be specific on what repairs
3. = Out of service / be specific why they are out of service

FACILITIES
Damage to the facility, specifically if can or cannot be continued to be used.

1. = Minimal or No damage
2. = Serious damage / be specific/ / repairs will be given a high priority
3. = Uninhabitable / personnel need to be relocated to another facility

ACCESS
A brief assessment of access to and from the location you are at.

1. = Clear
2. = Minimal blockage / most objects can be easily moved
3. = Major blockage / will delay response and require heavy equipment to move, assistance is required.

NEIGHBORHOOD
A rapid visual assessment of damage in the neighborhood from your location, based upon the percentage of destruction of the visible structures. A score between 0 (no damage) to 16 (100% structures) will be calculated.

FLOODING
Estimate a depth of flooding in feet for the immediate area.

REPORTING CONDITIONS
All information should be documented and forwarded to Boca Raton Fire Rescue Services EOC. Information should be sent via fax, phone or radio.

Rapid Damage Assessment

Rapid damage assessment will be conducted in a unit's primary response area. This action should take priority over routine work. This assessment will include both situations and needs. Target hazards should be evaluated as soon as possible. Information gathered during rapid damage assessment information should be documented and forwarded to Boca Raton Fire Rescue Services EOC. Information should be sent via fax, phone or radio.

BUILDING DAMAGE

1	**Low**	Minor damage to roof coverings and/or accessory structures such as screen enclosures, awnings, etc. Minor debris and tree limbs in roads, all roads open.
2	**Moderate**	Structures are intact with the exception of roof coverings and siding, shutters, missing or damaged. Some debris, utility lines down with minor random street flooding. Secondary roads are impassable due to debris, utility poles/lines and/or trees and flooding. Major roads have limited access.
3	**High**	Portions of roofs missing and structures open to weather, walls mostly intact with the exception of openings, extensive damage to accessory structures. Secondary roads are impassable due to debris, utility poles/lines and/or trees and flooding. Major roads have limited access.
4	**Extensive**	Roof and/or walls missing and open to the weather, buildings and accessory structures destroyed. Major roads and bridges are impassable due to debris, utility poles/lines and/or trees and flooding and erosion.

FLOODING DAMAGE

1	**None**	May have minor street and yard flooding. Minor debris and tree limbs in roads, all roads are open.
2	**Low**	Will have random street and yard flooding. Minor debris and tree limbs in roads, all roads are open.
3	**Moderate**	Roads may be impassable, flooding in buildings water may still be in some buildings.
4	**Extensive**	Roads are impassable, floodwaters are standing in buildings.

INFRASTRUCTURE DAMAGE

1	**None**	Minor debris and tree limbs in roads, all roads open.
2	**Low**	Some debris, utility lines down with minor random street flooding.
3	**Moderate**	Secondary roads are impassable due to debris, utility poles/lines and/or trees and flooding. Major roads have limited access.
4	**Extensive**	Major roads and bridges are impassable due to debris, utility poles/lines and/or trees and flooding and erosion.

The damage estimate should be based on the preceding definitions and the following photographs. The number should identify the level of damage that best describes the amount of damage sustained.

(Form B)

BOCA RATON FIRE RESCUE SERVICES OVERALL RAPID DAMAGE ASSESSMENT

Address or Roadway or Development	Cross Street or Map Page	Target Hazard Yes or no	Low 1	Moderate 2	High 3	Extensive 4	Time

Rapid Damage Assessment Program

Snapshot Survey Form

Date/Time _____

Location _____

Personnel _____ **(1=No injuries, 2=Minor injuries, 3=Serious injuries, state specifics)**

Equipment _____ **(1=All in service, 2=All in service, need repairs, 3=OOS, state units & specifics)**

Facility _____ **(1=Minimum damage, 2=Serious damage, 3=Uninhabitable)**

Access _____ **(1=Clear, 2=Minimum Blockage, 3=Major blockage)**

No damage equals 0	25% or less Damage	50% Damage	75% Damage	100% Damage
25% Structures	1	2	4	6
50% Structures	2	4	6	8
75% Structures	4	6	8	10
100% Structures	6	8	10	16

Snapshot score _____

Flooding _____**feet**